ARIZONA TRANSPORTATION INFORMATION SYSTEM

ATIS NEWS

Volume 3, Issue 1
Summer 1999

Arizona Geospatial Data Clearinghouse Node is Now Online!

By Santiago Garcia, Assistant State Cartographer

The Arizona node is online! This means users are able to search the Arizona metadata database for digital geospatial data. Searches are initiated through the Federal Geographic Data Committee (FGDC) web site at http://www.fgdc.gov/clearinghouse/. The search interface allows temporal, spatial and keyword queries.

The Federal Clearinghouse is designed to allow queries of distributed databases containing metadata compliant with the FGDC metadata standard. Queries result in a listing of viewable metadata records.

Metadata provides very detailed information on the data set(s) meeting your search criteria. Thus, the Clearinghouse serves as a powerful data discovery tool by querying databases which produce detailed information on data sets and information on how to obtain data.

The Arizona database is populated with metadata from the Arizona Land Resources Information System (ALRIS) legacy data sets. The database will grow very quickly as the University of Arizona's School of Renewable Natural Resources and USGS Cooperative Park Studies Unit includes the GAP data sets. The Arizona Game and Fish Department, Pima County and Maricopa County Department of Transportation are also in the process of creating FGDC compliant metadata.

The Arizona node is a joint effort between the Arizona State Cartographer's Office, Arizona Geographic Information Council, Arizona State Land Department, University of Arizona's College of Agriculture and USGS Biological Resources Division Cooperative Park Studies Unit.

We are always looking for additional participants. The greater the number of cooperators contributing metadata, the more robust the database becomes.

Please visit Arizona Geographic Information Council (AGIC) website at http://www.land.state.az.us/agic/ for more information on the Clearinghouse Node and metadata. Á

GIS Day 1999

The first annual GIS Day will be held on November 19th, 1999. Governments, schools, and businesses will be participating in this national program to support and teach GIS technologies. The event is part of National Geography week, sponsored by the National Geographic Society, Environmental Systems Research Institute (ESRI) and the Association of America Geographers (AAG).

Jack Dangermond, ESRI founder and president, states, "The idea behind GIS Day is to create a singel, worldwide event that effectively communicates the benefits and significance of GIS to the rest of society. There are currently about half a million GIS users in the world, but most of the public is unaware of this growing technology."

Many colleges and universities, as well as K-

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Inside this issue:

Upcoming Events

- GIS User Group meeting
  October 6, 1999 in
  Phoenix, Arizona
- 19th Annual
  ESRI User Conference
  July 26-30, 1999 in
  San Diego, California
- AGIC '99
  Arizona Geographic Information
  Council Annual Conference
  August 8-10, 1999 in
  Tucson, Arizona
- URISA Annual Conference
  August 21-25, 1999 in
  Chicago, Illinois
- North American
  Cartographic Information
  Society (NACIS) 19th
  Annual Conference
  October 20-23, 1999 in
  Williamsburg, Virginia

(see page 4 for details)

FREE GIS Data Viewer

In the Fall of 1997 ESRI, the GIS giant and creator of Arc/Info and ArcView GIS software, released the first version of ArcExplorer. Since that time over 500,000 copies of the free data viewer have been distributed. ArcExplorer is a stand-alone application that allows users to display and query a wide variety of standard data sources, either locally or across an Intranet or the world wide web!

What makes ArcExplorer so popular is its ease of use and functionality. With the simple GUI interface, anyone can browse, query, display and print GIS data. ArcExplorer works with ESRI shapefiles, Arc/Info coverages, Spatial Database Engine (SDE) layers and a wide variety of image formats (e.g. BMP, TIFF, ERDAS and more). And – functionality! — not only can you do the obvious tasks of pan, zoom and identify, but you can also perform additional tasks including:

- Thematic mapping using single symbol, unique value or class breaks
- Attribute querying and selecting on user defined criteria
- street address matching (for just one point at a time)
- Use an "overview" map to determine your zoomed viewing location (in other words, a reference map)
- measure distance (in miles, feet, meters or kilometers)
- Adjust the map scale properties and scaling factors
- Label features using flexible labeling tools (allows you to select colors, icons, fonts)

With ArcExplorer, you can create, save and print projects much like ArcView does. When used for viewing data on the Internet (or across an Intranet), ArcExplorer needs only to be connected to any ArcView or MapOjects based Internet Map Server (IMS).

ArcExplorer is the ultimate data exploration tool, providing powerful display and query tools as well as data serving and retrieval capabilities via the Web. For more information or to download a (absolutely!) FREE copy of ArcExplorer, visit ESRI's web site at http://www.esri.com/arcexplorer. Á

Another FREE GIS Data Viewer

Autodesk ®, makers of the popular AutoCad ® software, have a free GIS data viewer available as a plug-in for Netscape (version 3 or higher) and Internet Explorer (version 4.0 or higher). MapGuide allows users to interact with map-based information contained on one or many Autodesk MapGuide Servers. Applications are created using the Autodesk MapGuide Author with your existing GIS data (works with ESRI, MapInfo, Microstation, AutoCad, Atlas GIS, and even comma-delimited files). Maps can then be published across an intranet or directly to the Internet using the Autodesk MapGuide Server.

The viewer is fairly intuitive and simple to use. Some features require some clicking or reading of the help files to find them, but most features you will find with a right-click of your mouse in the map viewing area. With a right click you can select objects, create a buffer, measure distance, print the map and more!

The MapGuide Viewer works with Windows, MacIntosh and Solaris operating systems. Because it is a not a stand-alone product, is does require the use of an internet browser (Netscape or IE) to work.

Pima County DOT has created a MapGuide enabled website that you can view at http://www.dot.co.pima.az.us/gis/maps/ . A link to download the Viewer is available on the website. For more information about MapGuide, visit the mapguide website at http://www.autodesk.com/mapguide. Á

GIS Day 1999 *(con't)*

(Continued from page 1)

12 schools, are planning to participate in GIS Day by giving all students on campus an opportunity to see4 how different academic departments use GIS. Cities and private industry also are planning to participate by giving city employees and business professionals — and the general public — an opportunity to see how GIS technology is involved in so many different aspects of making organizations function on a day-to-day basis.

ADOT will be taking part of GIS Day by hosting a seminar to be held at ADOT's Human Resource Development Center (HRDC). The program is slated to begin at 9:00 AM and concluding at approximately 11:00 AM. An afternoon session may be held if necessary.

The session will open with a brief explanation of what GIS is and how GIS works. A description of GIS software and data used in ADOT will also be given. Several GIS users will give testimonies on how they utilize GIS to perform their jobs more efficiently.

Watch our website at http://map.azfms.com/atismain.html for more information on GIS Day '99. More information on ADOT's GIS day will also be published in the next edition of *ATIS News*.

For more information, contact Tony Gonzales at (602) 712-7818 or Jami Garrison at (602) 712-8958. Á

Autodesk MapGuide Viewer Features and Functionality

- Access live, secured, vector and raster data
- Connect to multiple, distributed geographic and attribute databases
- Available for Windows, Macintosh, and Sun SPARCstation
- < 2MB, easy to install and use
- Familiar browser interface
- View facility plans, as well as maps
- Select multiple objects by list, radius, polygon, buffer, and intersection
- Display multiline map tips
- Zoom to address or place name
- Pan and zoom
- Measure distances

Real World GIS

GIS Application: A Site Selection Tool

by Tony Sissons,
AICP, President, Research Advisory Services, Inc., Phoenix

About three years ago, I was contacted by a retailer who wanted our firm to help him find new locations for his business. He had opened twenty-four locations in metropolitan Phoenix, and wanted to double that number in the next three years. His first dozen locations had done very well, but more recent sites were falling short of his expectations. He wanted to see whether a "shot of science" could boost his marketing intuition.

I was only too happy to oblige! I had long wanted to use a GIS in a market-demographics model of business locations. I had tried to interest other multi-location retailers, but they all lost interest, either because they didn't want to reveal information about how well their existing locations were doing, or because they were uncomfortable trusting business location decisions to a statistical "black box".

The solution I proposed (and my client accepted) uses a GIS for several steps in a classical statistical multiple-regression model.

The first step was to agree upon a meaningful performance measure to use as the "dependent variable" in the statistical procedure. It should be a measure the client would view as closely reflecting the extent of variation in performance he was observing at his existing locations. Since the output of the model would be expressed in those same measurement units, it was important to pick a sensitive and meaningful measure. After some analysis, he chose "number of units sold in a week". I then told him I simply needed the street addresses and performance values for each existing location.

Since he has a neighborhood-serving product line, we agreed to assume that each location's trade area was a one-mile radius around the store. After his location and performance data arrived, I set up a GIS layer of 1990 Census Block Group polygons, and attached an attribute file of 100 demographic variables. Once the locations were address-matched, it was a simple GIS buffer task to select all Block Groups within a mile radius of each site, and aggregate the demographics. For each site, then, we had one dependent variable (the performance measure) and 100 "candidate" independent variables, all of which I exported to a database file compatible with my statistics software.

Using a simple-regression procedure, I examined, one at a time, the relationship between each demographic variable and the single performance variable. All I was interested in was the computed R^2 value for each variable pair. That figure can be interpreted as the percent of variation in performance explained by (attributable to) variation in the demographic variable. Rejecting low R^2 values, I narrowed the candidate list down to about 20 demographic variables.

Then it was time to start experimentally using different combinations of demographic variables in a multiple-regression setting. Each trial of a *combination* of demographic variables with the single performance variable also results in an R^2 value. In this case, it's an indication of the percent of variation in performance explained by the *aggregate simultaneous variation* of the particular combination of demographic variables. The statistics software also expresses each different combination of variables in the form of a predictive equation (or model). A simple example might look like this:

> Predicted performance value =
> 271 + 0.28 x (number of teenagers)
> + 3.18 x (percent Asian residents) -
> 0.65 x (workers using public transit)

I created eighteen different models, each explaining over 55 percent of the dependent variation. To evaluate each model, I plotted how well it predicted the actual values at each of the 24 sites. I selected the final model as being the one which minimized the sum of the absolute differences between actual and predicted values over all of the existing sites.

Now it's back to the GIS for model implementation! My business partner at the time had already created a "ring-study" GIS application for real estate clients. (You know -- show me how much vacant office space in one-, three- and five-mile radii around this property.) We adapted that application for my retail client by adding the final model's equation to the standardized ring study report, which consisted of a color map and demographic tables.

My client bought a copy of the same GIS software, upon which we installed the Block Group demographic database and the ring-study/prediction-model application. To use the prediction model, the retailer simply clicks a particular icon on his toolbar to activate the application, and then clicks on a potential site anywhere in Maricopa County. The application selects Block Groups within a one-mile radius, aggregates the demographic values of variables needed by the model, passes those values to the prediction equation, and displays the performance prediction for that site, together with other ring-study tables and maps.

Many other factors go into site selection, and my client knows them well, but he also now has a powerful location screening tool. Last year, he engaged our firm again to give the model a "tune-up" based on new performance values for thirty-four sites. He says that the model paid for itself the first time it steered him away from a bad location! Á

TIGER 98 Scheduled for Release in July

The U.S. Census Bureau is scheduled to release the latest version of its TIGER/Line files sometime in late July. TIGER/Line files are a digital database of geographic features, such as roads, railroads, rivers, political boundaries, and more that cover the United States. The TIGER database contains the geographic reference information about the location of these features in latitude and longitude. The files are *not* graphic images of maps but rather digital data describing geographic features. To use TIGER, you must have a GIS or mapping software package that can import TIGER/Line data. Demographic census data (i.e. population counts) are not included in the TIGER/Line files, but are available separately from the Census Bureau.

TIGER was developed by the Census Bureau to support the mapping and related geographic activities required by the decennial census and sample survey programs. The name is actually an acronym for Topologically Integrated Geographic Encoding and Referencing.

What to expect in the TIGER/Line 1998 release (changes from 1997):

- ✔Representative results from the 1998 Boundary and Annexation Survey
- ✔Updates from the TIGER Improvement Program and the Early Census Address Listing Operations
- ✔5-digit Zip code improvements from the August '98 USPS Engineering change file
- ✔Zip+4 codes from the August '98 USPS Zip+4 file, includes a sample file and technical documentation

Two additional releases are scheduled following the TIGER/Line 1998 release.

What to expect from TIGER/Line 1999 (due early 2000):

- ✔Representative results from the 1999 Boundary and Annexation Survey
- ✔Updates from Census Address Listing operations and Census Block Canvas operations
- ✔More updates from continuing pre-census operations including resolution of matching USPS address list, Address List Review updates by Local Governments, and major realignment/assignment of address ranges

What to expect from TIGER/Line 2000 (due early 2001):

- ✔Results from the 2000 Boundary and Annexation Survey and 2000 Boundary Validation Program (reference day on Jan 1, 2000)
- ✔Census 2000 Tabulation Areas and Identifiers (first time available to the public)
- ✔Results of more TIGER Update Operations

For additional information on TIGER, visit the Census Bureau's website at http://www.census.gov/. Á

UPCOMING CONFERENCES AND EVENTS

Give yourself an edge by attending a GIS event! Conferences are a great way to network with other GIS users, catch up on the latest technology advances and expand your knowledge of GIS.

GIS User Group Meeting

Mark your calendar now to attend the next User Group meeting on October 6, 1999 at 1:00 p.m. at the ADOT Traffic Operations Center, 2302 West Durango St, Phoenix. Everyone is invited to attend. The City of Phoenix Police Department is scheduled to give a presentation on how they are using GIS to analyze traffic accident data. Check our website at http://map.azfms.com/usergroup/ for more information or contact Jami at (602) 712-8958; email Jgarrison@dot.state.az.us.

ESRI 19th Annual User Conference

Always a must! If you only attend one GIS conference this year, make it the ESRI Annual event! Scheduled for July 26-30, 1999 in San Diego, California. Get more information from the ESRI website at http://www.esri.com

AGIC '99

The 1999 Arizona Geographic Information Council (AGIC) conference is scheduled for August 8-10, 1999 at the Marriott University Park Hotel in Tucson, Arizona. See our cover story on this conference for additional information or visit the conference website at http://www.srnr.arizona.edu/agic.

URISA Annual Conference

The 1999 Urban and Regional Information Systems Association (URISA) conference will be held August 21-25 1999 in Chicago, Illinois. This event features hundreds of IT/GIS presentations, vendor demonstrations, URISA workshops, Chapter meetings, Committee meetings, and a technical vendor exposition. Additional information can be found on their website at http://www.urisa.org.

SWUG '99

The ESRI Southwest User Group will hold its annual user group conference in Breckenridge, Colorado, October 12-14, 1999. The conference includes four (4) preconference workshops hosted by ESRI. Other highlights include plenary sessions, technical sessions, an ESRI Doctor's Office, a poster gallery and more. For more information visit the SWUG'99 website at http://www-gis.cudenver.edu/~gicc/swug99

NACIS Annual Conference

The North American Cartographic Information Society (NACIS) is hosting its 19th annual conference October 20-23, 1999 in Williamsburg, Virginia. Watch their website at http://www.nacis.org for details. Á

USGS Quad Maps Now Available to ADOT LAN Users

As part of ADOT's expanding GIS system, QuadsUSA has been installed on ADOT's Wide Area Network. QuadsUSA are USGS Quadrangle maps in electronic form. The quad maps are seamless and geo-referenced allowing them to be used in AutoCAD, Microstation, ArcView, Microsoft Word, and other Microsoft Widows programs.

A QuadsUSA Viewer makes access to the maps easy and fast. Maps can be located by Quad name, Township, Range, Section, benchmark (includes USGS benchmark data), geographic name, and milepost. Maps can be viewed in any scale: 1:250K, 1:100K, or 1:24K. Maps may be printed or exported to various file types.

For ADOT Intranet users, QuadsUSA maps for the entire State can be accessed by mapping your PC to the network drive, *\\r999ts21\QuadMaps*. The QuadsUSA program can then be started by double clicking the QuadsUSA icon.

You may copy the QuadsUSA icon to your desktop by selecting the QuadsUSA icon with your right mouse button and dragging it onto your desktop. After starting the QuadsUSA program, move up to the top pull-down menu and select File-Display Preferences. Go to the dialog box containing the Image File Directory. Type in the drive letter that your computer is network-mapped to access QuadsUSA.

A downloadable tutorial (MS Word or Acrobat format) can be found in the *Tutor* subdirectory. Please note that the quad maps are for official ADOT use only.

If you have any questions, contact Tony Gonzales at 602-712-7818. Á

ADOT/LTAP 1999 Authorized ArcView Classes
(taught at ADOT Human Resource Development Center, Phoenix)

August 17-18, 1999

October 20-21, 1999

GIS User Group

Have you attended a GIS User Group meeting yet? We have had a good turnout at the last few meetings. The most recent meeting, held on June 23rd at the ADOT Traffic Operations Center (TOC) had 17 people in attendance! Dr. W. Sundin Applegate of the AZ Dept of Health Services (DHS) demonstrated how he uses GIS to track birth and death statistics. He also showed us how he has experimented with ArcView Spatial Analyst extension to find statistical distributions of teenage pregnancies.

Sandra Weir of Mosaic Analytic Planning also gave a presentation. Ms. Weir's presentation was on the various planning aspects that go into developing a mapping project.

Thank you to both Sundin and Sandra for taking the time to share your knowledge with the rest of us!

At our October meeting, we are scheduled to have a presentation by the City of Phoenix Police Department. If you would like to give a presentation, please contact Jami Garrison at (602) 712-8958. See page 4 of this newsletter for more details on the upcoming October meeting. Á

Training News

ArcView ESRI-Authorized Course

ADOT provides ESRI Authorized training four times a year at little or no cost for ADOT employees. Local government employees are also eligible to attend these classes through the Local Technical Assistance Program (LTAP) at a reduced rate. If you are interested in attending either of the two remaining courses offered this year, contact Stephanie DeLeon of LTAP at (602) 255-8461.

Sorry, but we cannot allow any consultants or other private industry employees to enroll in the class. Non-government employees can find a list of Authorized Instructors on ESRI's website at http://www.esri.com.

Advanced ArcView Course

We have received quite a few requests for an Advanced ArcView course. Currently ESRI offers an Advanced course, but it is only available through ESRI training centers and not through the Authorized Teaching Program like the Introduction to ArcView GIS course. ADOT has the opportunity to offer an Advanced ArcView class by having an ESRI instructor come teach the course at our training site. The cost for the course would be approximately $700. It would be limited to ADOT and local government employees only (through LTAP), and the class size is restricted to only 12 students. If you are interested in this course, please contact Jami at (602) 712-8958 or via email at Jgarrison@dot.state.az.us. If enough interest is generated, we will schedule a class.

New ESRI Training Center in Arizona!

Mesa Community College has recently become an official ESRI training center. What this means is that ESRI courses are taught on site by ESRI employees. ESRI's newest course, *Advanced ArcView GIS*, will be taught at Mesa Community College (MCC) on these dates in 1999: August 23-25 and December 7-9. The cost for this three-day course is $1200. Enrollment for courses offered through MCC is open to anyone.

Other courses offered through MCC include *Intro to ArcView*, *Intro to Avenue*, and *Intro to Workstation Arc/Info using ArcTools*. Contact the MCC Business & Industry Institute at (480) 461-6100 for more information on course registration and availability of these courses. Á

ADOT Announces New

Mary Lynn Tischer will be joining ADOT as the Director of Transportation Planning (TPD) on August 23, 1999.

Mary Lynn comes to Arizona from Boston where she has been Director of the Office of System and Economic Assessment at the Volpe National Transportation Systems Center, US Department of Transportation, since 1997. Prior to this position she worked with Senator John Warner in providing technical assistance on re-authorization legislation which resulted in the Senate version of ISTEA II. In addition, Mary Lynn has held other positions with the Virginia Department of Transportation, FHWA, and the University of Maryland. She has a Ph.D. in Political Science and has been active in AASHTO and the Transportation Research Board.

During the interim period between directors, Dale Buskirk served as the acting Director of TPD. Dale is the Manager of the Advanced Planning Team. While only in the position a short while, Dale's leadership and service did not go unnoticed as he helped work through many challenging issues.

All of us in TPD would like to thank Dale for his leadership and to welcome Mary Lynn to the ADOT-TPD family! Á

Internet Mapping Made Simple

This extension is known as the iMapper extension and is available for free to anyone who wants to use it! There are still a few bugs in it, but overall I had no problem creating an image map and all the associated HTML files in less than 10 minutes. You don't even need to know HTML to use this extension.

Using ArcView you can quickly create a website to display your maps along with the (limited) ability to identify attributes from the map. With iMapper no server interaction is required! If you have webspace somewhere then you can put your ArcView maps and data on the web.

Here's how to create an image map in under 10 minutes using the iMapper extension (from the README file):

Open ArcView, load the iMapper extension. Open a view, add some basic data. Click on the multi-colored iMapper button to bring up the main iMapper dialog.

Click on the Create Grid button. This will allow you to create an area of interest in your view that will be displayed on the website. Select the size of the grid you want (2x2 up to 10x10) and choose a color for the grid lines.

Click on the button below the grid color selector. This button will allow you to draw the grid on the view. When drawing your area of interest keep in mind that if you plan to be able to identify features that are very dense, such as cities or counties, that you should keep your area of interest to a relatively small scale. This is because you don't want to cause a major drain on your system resources.

Once you have drawn your grid click on the Add Attributes button on the main dialog. This gives you the option of selecting which themes you would like to be able to identify features on, on the web site. (currently only polygon and point themes are available for identification)

After selecting (or not) the themes for identification, click on the Webpage Styles button on the main dialog. This will allow you to choose the pan button style, background color, text color, link color, visited link color and whether or not you want to keep the grid lines on the image when it is exported.

Then click on the Webpage Details button on the main dialog. This will let you put a title on your webpages, specify the webpage maintainer and their email address. The Web Page File Names box is used to give all the output documents a prefix to help keep track of different project websites.

You may also specify the images' size for the webpages as well as what type of image to be exported by clicking on the Image Type button. When you click on this button another dialog will appear asking you what type of image you want all your images to be exported in. If you choose convert images to gif format using gif converter provided and then click Ok, you will need to navigate to where you placed the iview_32.exe program. You will also have to agree on the license agreement for the program. You cannot use this gif converter for commericial use unless you get permission from the creator. Read the iview about. txt file for more info on this.

Once back at the main dialog, enter the directory where you will be placing all the output html and image files from the iMapper extension. (ie. c:\inetpub \wwwroot\)

Once all this has been done you can click the Run It button on the iMapper main dialog. This starts the process of creating your website. The time it takes for it to finish depends on your system resources, the number of themes, the size of the themes attribute tables you want identified, and the size and number of grids for your area of interest.

Once the iMapper is finished, bring up your browser. The browser needs to be 4.x or higher due to extensive javascripting. Go to File...Open and navigate to where you placed the output files on your system (ie. c:\inetpub \wwwroot\) Find the file called <prefix>index.html where <prefix> is the name you entered in the Web Page File Names box.

Any questions or comments contact : iMapper@hotbot.com

For more information or to download this script point your browser to: http:// pages.hotbot.com/rel/imapper/iMapper. html Á

TPD Website Receives a Facelift!

The Arizona Transportation Planning Division's (TPD) website has a new look. From the main page you can link to many of the other areas within TPD.

GIS & ATIS Roads

In the section for "GIS & ATIS Roads Information" you will find:

* a description of ATIS Roads;
* a section on the progress of the ATIS Roads update project;
* a link to interactive maps of the state highway system;
* this newsletter in it's online version;
* and a section devoted to the GIS User Group.

Also new is a list server for the GIS User Group. Anyone can sign up to send and/or receive list serve announcements related to the GIS User Group. Visit the User Group web page for information on joining the List.

Highway Data

The Highway Data section is being designed to disseminate ADOT's highway data from the Data Team. The data is not yet available via the website, but is in the process of being made internet-ready. An example of the type of highway data that will be made available is: highway length and travel information (typically by individual county, highway functional class, state versus nonstate, etc.), system traffic volume and classification data, as well as aggregate travel statistics for state and/or nonstate highway systems.

Priority Programming System

The Priority Programming System section, like the Highway Data section, is a work in progress. When completed, you will be able to query the Priority Programming database for information on projects. While still in it's test phase, if you use Internet Explorer you should be able to access the database and query it.

Transit Team

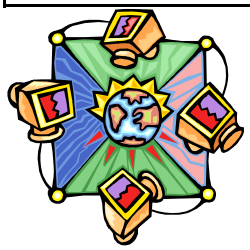
The Transit Team's web pages have information and resources on transit related issues in ADOT. Check here for current information as it relates to Transit in Arizona.

Vision 21 Task Force

Information on the Governor's Transportation Vision 21 Task Force (Governor's Vision-21 Task Force) can be found from TPD's website as well. Information on upcoming and past meetings plus committee membership can be found on the website.

Visit our newly redesigned site at :
http://map.azfms.com

Worthy Websites



Mathematics of Cartography

http://math.rice.edu/~lanius/pres/map/

Developed by a teacher training and student technology council program, this website is loaded with information on maps and map making. Because it was developed for use as a teaching tool, it also has some lesson details for teachers as well as links to many related resource websites.

Geography at Mining Co

http://geography.miningco.com

A complete list of geography related articles and website on the subject of geography. Chances are, if you're looking for some information about geography, you will find it here!

Cartographical Map Projections

http://www.ahand.unicamp.br/~furuti/ST/Cart/CartIndex/cartIndex.html

It may not be the flashiest internet site and the URL is pretty long, but this site has some great information about map projections. Whether you just want to know what a map projection is or whether you're wanting to see the difference between several different projections, this is the site for you!

Demographic Data Viewer

http://plue.sedac.ciesin.org/plue/ddviewer/

Demographic Data Viewer: An on-line mapping application allowing you to map census variables down to census tract level (choose from over 200 variables; data from l989). The viewer is available in both java and non-java versions. An excellent site, when the server is online! (recently I have not had luck accessing the data server to view the maps. Brought to you by the Socio-economic Data and Applications Center (SEDAC) which is developed and operated by the Center for International Earth Science Information Network (CIESIN).

ARIZONA TRANSPORTATION INFORMATION SYSTEM

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ATIS NEWS

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If you are not currently on our mailing list and would like to be, contact Jami Garrison at the contact information listed below. Comments, questions or articles may also be submitted. Deadline for submissions to the Fall 1999 issue is September 3, 1999.

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YOU ARE INVITED! The Next GIS User Group Meeting will be held on Wednesday, October 6, 1999. Mark your calendar now! The meeting will be held in Phoenix from 1:00 p.m. to 3:00 p.m. at ADOT's Traffic Operations Center, 2302 West Durango St, Phoenix. For more information contact Jami Garrison at (602) 255-8958 or email JGarrison@dot.state.az.us.